

question, and these, after a proper geological survey, the Government ought to undertake, to assure to the people as a whole benefits to which all are entitled.

Inland the rocks are more broken and shattered than towards the coast, and so the oil reaches the surface by means of the fractures, it being forced upward by the gases that are seeking an exit. But the practical tests must settle the question. As far as my own personal knowledge goes I have indicated the location of the greensands and oil-bearing shales, and it is for those who desire to obtain oil and who have faith in the facts to put theory to the test, or else call on the Government to carry out a proper geological survey, with a view to obtaining more reliable data than I have been able to give here.

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#### ART. XLVII.—*Notes on Two Marine Gymnomyxa.*

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[Read before the Wellington Philosophical Society, 5th September, 1906.]

Plates XXV and XXVI.

WHEN tracing the development of a polychæte worm, in January of this year, I observed in the gelatinous matter in which the eggs of the worm were imbedded two *Gymnomyxa*—one a member of the *Lobosa*, the other nearer to the *Labyrinthulidea* than to any other class. I had these organisms under observation at the seaside during a fortnight; but I was not able in that time to fully trace the life-history of either. These notes must therefore be regarded as preliminary only.

#### *Amœba agilis*, n. sp. Plate XXV.

Endoplasm often not noticeably granular in appearance; pseudopodia varying, being sometimes blunt and rounded, at others tapering and flexible. Nucleus occasionally visible in unstained specimens: always easily seen in stained specimens. No contractile vacuole. Sometimes the animal is sluggish, but usually it moves quickly and, when well nourished, divides rapidly. When preparing for division the animal usually draws itself out into two masses, a more active mass drawing away, as it were, from a less active mass, the two remaining connected for a short time by an isthmus of non-granular matter, which finally gives way. In Plate XXV, figs. 1 to 27, are given outlines

of an *Amœba* preparing for division. It will be noted that the animal frequently draws itself out into two or more masses before finally dividing. In this case the preparatory stages occupied thirteen minutes. The new *Amœba* to the left in fig. 27 divided again in five minutes; that to the right in fifteen minutes.

Streaming of the endoplasm is very marked and often very rapid, with sudden reversal. Streaming and change of shape cease at the same moment. At this moment the animal has become somewhat pear-shaped, the broad end leading. Then comes reversal of streaming and of movement, either immediately or after a very short rest. It is usual for the animal to move four or five times its own length before reversal. ||

The food of the animal consists, so far as it is visible, mainly of small diatoms and other unicellular plants. When the animal comes near a diatom the latter approaches it at a very rapid pace, appearing to rush to it. I could observe no mechanism to account for this. Food-vacuoles could not be detected. Fæces were egested slowly or quickly; if quickly, at the end of a pseudopodium.

The average diameter of the animal is about 0.1 mm.

#### *Myxoplasma rete*, n. gen. et sp. Plate XXVI.

Body flattened, apparently because the protoplasm is too fluid to resist gravitation. This flattened body may surround two or more large spaces and several smaller ones. Delicate pseudopodia are emitted, and these often anastomose. The protoplasm streams along these pseudopodia, gathering itself into larger or smaller masses here and there. At first the pseudopodia do not contain granular endoplasm, but this streams in and often becomes separated from the main granular mass. A notable feature of the pseudopodia is that they often exhibit waving movements like those of the tentacles of many hydroïds. This movement is generally slow. At times a mass of granular matter detached from the main granular portion and surrounded by non-granular matter may be observed to move rapidly along the margin of the body, as though its non-granular isthmus actually rushed along. This indicates great contractility, and at the same time great fluidity of the non-granular matter. Nuclei were not observed. In general appearance the body resembles closely an active plasmodium of a Mycetozoon; but whether it originates as such a plasmodium does I am unable certainly to say.

A slide that had been under observation for eight days was left unobserved for three days during my absence. When I

returned, the organism as I had observed it had disappeared. In its place were many active flagellulæ, each with a well-marked nucleus and a large vacuole, non-contractile (Plate XXVI, fig. 5). The body of a flagellula is pear-shaped, with a long flagellum at the posterior end. Nothing like an eye-spot is visible. These flagellulæ aggregated in places into small masses, losing their activity but not becoming fused. In connection with these quasi-plasmodia, or often not in connection with them, the flagellulæ formed into long strings and loose networks. In this stage the resemblance to the fibres and spindle cells of *Labyrinthula* is unmistakable. I did not, however, observe any spindle cells that moved along the threads.

I am not, of course, sure that the plasmodium-like body that I have called *Myxoplasma* broke up into flagellulæ. I am certain only that these appeared after *Myxoplasma* had disappeared, and that they united to form the *Labyrinthula*-like network. The network remained unaltered until I came to town, bringing it with me for permanent preparation.

The average long diameter of *Myxoplasma* is about 0.15 mm.

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#### EXPLANATION OF PLATES XXV AND XXVI

##### PLATE XXV. *Amæba agilis*.

Figs. 1-27. Actively dividing form, drawn at intervals of 30 seconds. At fig. 27 division is complete.

Figs. 28-46. Actively moving form with tapering pseudopodia. Drawn at intervals of 25 seconds.

Figs. 47-49. A diatom passing through the body. Total time, 49 seconds.

##### PLATE XXVI *Myxoplasma rete*.

Figs. 1-3. A specimen drawn at 3.56 p.m., 4.3 p.m., and 4.10 p.m. At *a* is a diatom.

Fig. 4. Network of flagellulæ, possibly not connected with *Myxoplasma*.

Fig. 5. Active flagellulæ.